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Roads General Authority

Workshop Partner



VanJee WIM(Weigh-In-Motion) Direct Enforcement System for Saudi Arabia



#SaudiIntermobility



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Speaker Info

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1 - WIM Status in the Kingdom

Since 2010, there is an existing network of 31 high speed WiM pre-selection systems distributed throughout KSA. These sites are partnered with fixed weighing stations that utilise low speed weigh in motion systems and basic IT technology.



2 - Target of Tahakom: WIM Direct Enforcement



Tahakom is Saudi Technology and Security Comprehensive Control Co. Ltd. They represent MOT and MOI to implement WIM direct enforcement in KSA.

As part of the weight and dimension programme (WDP), Tahakom is looking to implement a direct enforcement pilot. The overall objective of the direct enforcement approach is to significantly reduce the number of offending vehicles, ultimately reducing road maintenance costs and traffic accidents. The purpose of the pilot is to evaluate the effectiveness of equipment, performance of the supplier, and suitability of direct enforcement in Saudi Arabia, with a view to roll-out systems across the entire road network in the Kingdom.



3 - VanJee WIM Direct Enforcement Introduction



- The direct enforcement system is divided into a front-end detection system and an integration software.
- The front-end detection system includes WIM sensors, LiDAR sensors, cameras, they are used to acquire vehicle weight, vehicle dimension, vehicle pictures and license plate information.
- The integration software is used to gather data and assemble evidence from all front-end detection devices, store vehicle data and issue violation tickets for overlimit vehicles.

4 - VanJee WIM Direct Enforcement Implementation



- In general, the system includes WIM subsystem, ANPR subsystem, LiDAR dimension detection subsystem, video monitoring subsystem, data processing subsystem, and violation package issuing subsystem.



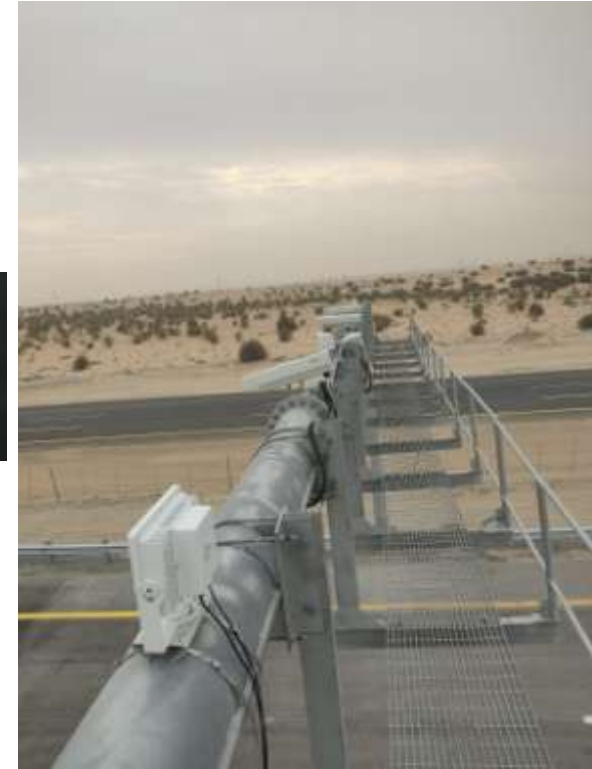
5 - VanJee Weigh-In-Motion Subsystem

- In this project, 36 WIM sensors are used on three lanes, 12 sensors per lane.
- The weighing accuracy required to be at least 95% (gross weight) as per COST 323 international standard. Tahakom admitted that VanJee system meet the requirement of weight accuracy, that is first verification $\pm 2.5\%$, on-use $\pm 5\%$.



6 - License Plate Recognition Subsystem(ANPR)

- Three license cameras are used to cover three lanes to capture plate image (plate number) and vehicle front image, two dome cameras are used to capture vehicle side image.
- The license recognition rate is required to be 90% accuracy or higher during day or night, after changing to use HIKVISION, the accuracy is achieved.



7 - Video Monitoring Subsystem

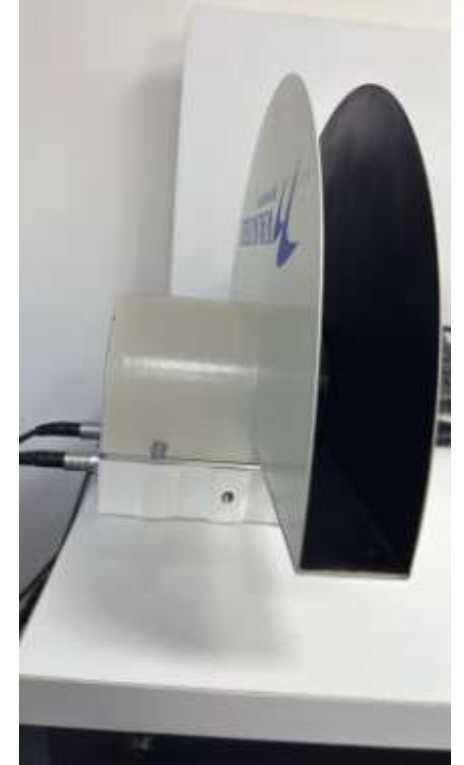


- Two dome cameras are installed take video while vehicle passing and capture vehicle side images to show the axle number of each vehicle, as a complete evidence chain.

8 - VanJee LiDAR: Vehicle Dimension Measurement Subsystem



- VanJee LiDAR measure vehicles on all lanes and the error is less than 5% in vehicle length, width, and height.



9 - Data Processing Subsystem

Index	License_Plate	License_Plate_Color	Detection_Time	Truck_Len	Total_Weight	Axis_No	Axis_Weight	Speed	Direction
808	67099677	yellow	2024-10-18 16:27:51.000	1	29100	4	0	47	Ny
809	611036008	yellow	2024-10-18 16:27:52.000	1	28000	5	0	47	Ny
810	671777024	blue	2024-10-18 16:27:53.000	1	18800	-2	0	49	Ny
811	600000000	blue	2024-10-18 16:28:00.000	1	29700	4	0	46	Ny
812	610410004	yellow	2024-10-18 16:28:08.000	1	18200	5	0	47	Ny
813	6075	blue	2024-10-18 16:28:08.000	1	18200	3	2	49	Ny
814	600000224	yellow	2024-10-18 16:28:48.000	1	20500	4	0	37	Ny
815	603660	yellow	2024-10-18 16:29:12.000	1	28300	5	0	39	Ny
817	699277024	white	2024-10-18 16:29:00.000	1	16000	3	0	40	Ny
816	6A2A	white	2024-10-18 11:27:53.000	2	30300	5	0	39	Ny
818		white	2024-10-18 11:27:53.000	2	30200	4	0	40	Ny
819		white	2024-10-18 11:27:58.000	2	19400	3	0	39	Ny
823		white	2024-10-18 11:28:08.000	2	30000	4	0	36	Ny
821	7181796A	white	2024-10-18 11:28:57.000	2	28100	3	0	39	Ny
822	604	yellow	2024-10-18 11:28:58.000	2	30200	5	0	38	Ny
825	6012	blue	2024-10-18 11:29:31.000	2	19200	3	0	39	Ny
669	6010	blue	2024-10-18 11:29:28.000	2	29900	6	0	36	Ny
668	6A2	white	2024-10-18 11:29:02.000	2	18000	2	0	39	Ny
667	601	blue	2024-10-18 11:28:12.000	2	18000	3	0	38	Ny
666	602	green	2024-10-18 11:14:24.000	2	30000	5	0	40	Ny
665	6A2	blue	2024-10-18 11:14:06.000	2	19400	3	0	40	Ny
664	6A01796AE	white	2024-10-18 11:09:27.000	2	19400	3	0	43	Ny
663	6A1	blue	2024-10-18 11:08:29.000	2	8300	2	0	37	Ny

- VanJee Highspeed integration software gather and match all data of each vehicle, assemble evidence of a violation from all the equipment (WIM, Dimensions Measuring Scanner and ANPR) into a data package.
- The Highspeed software is a User Interface for demonstration, database query, generating vehicle report and creating violation tickets.



10 - Violation Package Issuing

- VanJee integration software creates Violation Ticket for each vehicle.
- VanJee integration software provides the following violation package outputs.

vi. Violation package Outputs

The Trucks Violation Package includes violation details, fines, and vehicle information, along with measurement data shown in table 5 and figures (1,2) below:

Violation Package components:	
Gross vehicle weight	Group of axles load
Vehicle axle spacing	Wheel load (axle side)
Vehicle classification	Wheelbase and length
Vehicle speed	Vehicle height
Axle of group load	Vehicle width
Single axle load and limits	Vehicle length
Date and time of event	Number plate reading
Axle number	License type
License plate image	Truck full image showing all axles clearly
Site Coordination	Scale Code
Load type	Serial number
Printing time	Origin Place
Destination Place	Start trip
End trip	Total violation amount
The dimensions exceeding the limit.	Detailed violation amount -dimension
Total excess gross weight	Detailed violation amount - gross
Actual weight of the axles	
The axles exceeding the allowed load.	Detailed violation amount - axles

Direct Enforcement Abu Hadriya Violation Ticket

2024-10-20 12:51:10	File	Employm of Truck Axles
5:20:44 pm	Printing time	Ministry of Transportation and Logistics Direct
438888	Serial number	Enforcement Abu Hadriya
		Site Coordination

Truck information and classification

2000	Vehicle weight limit	2-Axle Truck	Vehicle type
21000	Actual vehicle weight	02	Axle number
YY79/775	License number	Eastern Region	Origin place
General	License type	Eastern Region	Destination place
Normal	Load type	Dammam	Start trip
47	Speed (km/h)	Khafj	End trip

Violation Fee

Total fine amount (SAR)	1000	Over gross weight amount (SAR)	0
		Over axle dimension amount (SAR)	1000
		Axle over weight amount (SAR)	0

Axle and dimension information

	Axle 1	Axle 2	Axle 3	Axle 4	Axle 5	Axle 6
Axle weights limit (kg)	8000	10000	10000	0	0	0
Actual axle weights (kg)	3800	8800	8800	0	0	0
Weights exceed by (kg)	0	0	0	0	0	0
Axle clearance (m)	4.42	1.27	0	0	0	0
Actual dimension (mm)	11142	2714	2010	4610		
Dimension limit (mm)	14300	2000	2000	4600		
Dimension exceed by (mm)	0	114	0	0		



11 - VanJee and Traffic Tech's Partnership

- Traffic Tech is an award-winning, ISO-certified total solutions provider specializing in traffic management, intelligent transportation systems (ITS), parking management, security, communications, and truck weigh stations.
- Founded in 2000, TTG has grown into one of the leading ITS companies in the region, operating with 1,400+ employees, 250+ vehicles, 3,500 m² of offices, and a 7,000 m² warehouse facility.
- Traffic Tech is proud to serve as VanJee's first strategic partner in the Middle East for advanced 3D LiDAR solutions. This partnership positions Traffic Tech at the forefront of next-generation sensing technologies in the region, enabling the deployment of high-precision traffic data collection, WIM integration, and smart-mobility applications - including self-driving, autonomous-vehicle support, and V2X communication systems - powered by VanJee's state-of-the-art 3D LiDAR technologies.



12 - Conclusion

- VanJee's mission is to protect road, ensure road safety and improve traffic efficiency of the Kingdom. VanJee has significant regulation experience against overload trucks. VanJee is dedicated to provide WIM and LiDAR solution to protect KSA's road and bridge. VanJee would always solve clients's major problems by relying on our expertise and dedication.



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